AMENDMENT

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An apparatus for use in seismic surveying ~~adapted for seismic data acquisition~~ in a land or transition zone environment, said apparatus comprising:

a positioning device;

a seismic sensor, capable of being placed near said positioning device; and

means for determining the distance between said seismic sensor and said positioning device using an airborne acoustic transmission between said positioning device and said seismic sensor.

2. (Original) An apparatus as claimed in claim 1, in which said airborne acoustic transmission is produced by a speaker at said positioning device and received by a microphone at said seismic sensor.

3. (Canceled)

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46. (Previously Presented) The apparatus of claim 2, wherein said airborne acoustic transmission received by said microphone at said seismic sensor is converted from analog to digital format using an analog to digital converter that is also used to convert seismic signals received by said seismic sensor from analog to digital format.

47. (Previously Presented) The apparatus of claim 2 wherein said airborne acoustic transmission received by said microphone at said seismic sensor is transmitted using a cable that is also used to transmit seismic data received by said seismic sensor.

48. (Previously Presented) The apparatus of claim 1, wherein said airborne acoustic transmission is a spread spectrum acoustic signal.

49. (Previously Presented) The apparatus of claim 1, wherein said airborne acoustic transmission is a pulse, frequency sweep, or digitally encoded sweep acoustic signal.

50. (Previously Presented) The apparatus of claim 1, wherein said airborne acoustic transmission is generated by signal generation circuitry that is also used to test said seismic sensor.

51. (Previously Presented) The apparatus of claim 1, further including a temperature sensor for measuring the temperature of the air near said seismic sensor or said positioning device.

52. (Previously Presented) The apparatus of claim 1, further including a survey flag and wherein said positioning device is placed near said survey flag.

53. (Previously Presented) The apparatus of claim 1, wherein said positioning device is a first positioning device and further including a second positioning device and means for determining the distance between said second positioning device and said seismic sensor using an airborne acoustic transmission between said second positioning device and said seismic sensor.

54. (Previously Presented) The apparatus of claim 53, further including means for determining the distance between said first positioning device and said second positioning device.

55. (Previously Presented) The apparatus of claim 54, wherein said means for determining the distance between said first positioning device and said second positioning device uses an airborne acoustic transmission between said first positioning device and said second positioning device.

56. (Previously Presented) The apparatus of claim 53, wherein said first positioning device and said second positioning device are connected by a cable.

57. (Previously Presented) The apparatus of claim 53, wherein said second positioning device is placed at a predetermined azimuthal orientation with respect to said first positioning device.

58. (Previously Presented) The apparatus of claim 53, further including means for confirming that said second positioning device has been placed at a predetermined azimuthal orientation with respect to said first positioning device.

59. (Previously Presented) The apparatus of claim 53, wherein a seismic source signal is used to resolve the line symmetry ambiguity when determining the position of said seismic sensor with respect to said first positioning device and said second positioning device.

60. (Previously Presented) The apparatus of claim 1, wherein said seismic sensor is a first seismic sensor and further including additional seismic sensors and means for determining the distance between said additional seismic sensors and said positioning device using airborne acoustic transmission between said positioning device and said additional seismic sensors.

61. (Previously Presented) The apparatus of claim 60, further including means for calculating a group center of gravity for said first seismic sensor and said additional seismic sensors.

62. (Previously Presented) The apparatus of claim 60, further including means for determining whether said first seismic sensor and said additional seismic sensors have been laid out in a prescribed order.

63. (Previously Presented) The apparatus of claim 1, wherein said seismic sensor and said positioning device are located at a first seismic station and further including an additional positioning device located at a second seismic station and means for determining the distance between a device located at said first seismic station and a device located at said second seismic station.

64. (Currently Amended) A method for use in a seismic survey ~~of determining the position of a seismic sensor adapted for seismic data acquisition~~ in a land or transition zone environment, said method comprising the steps of:

placing a positioning device in a particular location;

placing a seismic sensor near said positioning device; and

determining the distance between said seismic sensor and said positioning device using an airborne acoustic transmission between said positioning device and said seismic sensor.

65. (Previously Presented) The method of claim 64, wherein said airborne acoustic transmission is produced by a speaker at said positioning device and received by a microphone at said seismic sensor.

66. (Previously Presented) The method of claim 65, wherein said airborne acoustic transmission received by said microphone at said seismic sensor is converted from analog to digital format using an analog to digital converter that is also used to convert seismic signals received by said seismic sensor from analog to digital format.

67. (Previously Presented) The method of claim 65, wherein said airborne acoustic transmission received by said microphone at said seismic sensor is transmitted using a cable that is also used to transmit seismic data received by said seismic sensor.

68. (Previously Presented) The method of claim 64, wherein said airborne acoustic transmission is a spread spectrum acoustic signal.

69. (Previously Presented) The method of claim 65, wherein said airborne acoustic transmission is a pulse, frequency sweep, or digitally encoded sweep acoustic signal.

70. (Previously Presented) The method of claim 64, wherein said airborne acoustic transmission is generated by signal generation circuitry that is also used to test said seismic sensor.

71. (Previously Presented) The method of claim 64, further including the step of measuring the temperature of the air near said seismic sensor or said positioning device.

72. (Previously Presented) The method of claim 64, wherein said positioning device is placed near a survey flag.

73. (Previously Presented) The method of claim 64, wherein said positioning device is a first positioning device and further including the step of determining the distance between a second positioning device and said seismic sensor using an airborne acoustic transmission between said second positioning device and said seismic sensor.

74. (Previously Presented) The method of claim 73, further including the step of determining the distance between said first positioning device and said second positioning device.

75. (Previously Presented) The method of claim 74, wherein said step of determining the distance between said first positioning device and said second positioning device uses an airborne acoustic transmission between said first positioning device and said second positioning device.

76. (Previously Presented) The method of claim 73, wherein said first positioning device and said second positioning device are connected by a cable.

77. (Previously Presented) The method of claim 73, wherein said second positioning device is placed at a predetermined azimuthal orientation with respect to said first positioning device.

78. (Previously Presented) The method of claim 73, further including the step of confirming that said second positioning device has been placed at a predetermined azimuthal orientation with respect to said first positioning device.

79. (Previously Presented) The method of claim 73, wherein a seismic source signal is used to determine to resolve the line symmetry ambiguity when determining the position of said seismic sensor with respect to said first positioning device and said second positioning device.

80. (Previously Presented) The method of claim 64, wherein said seismic sensor is a first seismic sensor and further including additional seismic sensors and the step of determining the distance between said additional seismic sensors and said positioning device using airborne acoustic transmissions between said positioning device and said additional seismic sensors.

81. (Previously Presented) The method of claim 80, further including the step of calculating a group center of gravity for said first seismic sensor and said additional seismic sensors.

82. (Previously Presented) The method of claim 80, further including the step of determining whether said first seismic sensor and said additional seismic sensors have been laid out in a prescribed order.

83. (Previously Presented) The method of claim 64, wherein said seismic sensor and said positioning device are located at a first seismic station and further including an additional positioning device located at a second seismic station and the step of determining the distance between a device located at said first seismic station and a device located at said second seismic station.

84. (Previously Presented) The method of claim 64, further including the steps of recording seismic data acquired by said seismic sensor and assigning sensor position coordinates to said seismic data based on said distance between said seismic sensor and said positioning device.

85. (Previously Presented) The method of claim 64, further including the step of calculating a deviation between actual seismic sensor position coordinates and planned seismic sensor position coordinates.

86. (Previously Presented) The method of claim 85, further including the step of compensating for said deviation between said actual seismic sensor position coordinates and said planned seismic sensor position coordinates.

87. (Previously Presented) The method of claim 86, wherein said compensation step includes mathematically moving a group center of gravity from an actual position to a planned position.

88. (Previously Presented) The method of claim 87, wherein said compensation step includes bypassing a digital ground roll removal process.